What is claimed is:

1. A method for determining the drying rate of a liquid film, comprising:

applying an amount of the liquid onto a first piece of a substrate to form an initial rollout proof having a head where the liquid is first applied to the substrate and at least one tail where the liquid is last applied to the substrate;

allowing the liquid to at least partially dry for a predetermined period of time;

repeating steps (a) - (b) to prepare at least one second rollout proof on a second piece of the substrate, said after rollout proof having a head where the liquid is first applied to the substrate and at least one tail where the liquid is last applied to the substrate, and allowing the second rollout to at least partially dry for the same predetermined period of time allowed to elapse in (b);

utilizing a densitometer to measure the density of each of the at least partially dried first and second rollout proofs, at the tails of the respective rollout proofs;

repeating steps (a) - (d) a plurality of times;

plotting the measured density of the tails of each of the respective rollout proofs versus a parameter related to the elapsed time at which the density measurement was made, to form a graph with at least one curve, which is representative of the drying rate of the liquid.

2. The method according to claim 1, wherein at least three replications of each sample are performed and average values of all of the measured density values for corresponding replications are plotted to form the graph.

3. The method according to claim 1, wherein in step (e), from 2 to 20 repetitions of steps (a) - (d) are performed until complete drying of the sample is attained, to provide a corresponding number of density measurements at the tails of the rollout proofs for use in plotting to form the graph of the curve representative of the drying rate of the liquid.

4. The method according to claim 1, wherein the liquid is selected from the group consisting of coatings, inks, and paints.

5. The method according to claim 1, wherein when the liquid is an ink.

6. The method according to claim 1, wherein when the liquid is a flexographic ink.

7. The method according to claim 6, wherein the flexographic ink is selected from the group consisting of: water-based ink for paper packaging, solvent-based ink for film, and water-based ink for film.

8. The method according to claim 1, wherein the at least one curve that is representative of the drying rate of the liquid is a plot of print density of the liquid, as measured by the densitometer at a predetermined point of time, versus sample number or tail number corresponding to that densitometer measurement.

9. The method according to claim 8, wherein the at least one curve representative of the drying rate of the liquid is selected from a plot of: average initial and average after density measurements versus sample or tail number; differences between the average after and average initial density measurements ($\Delta = \rho_A - \rho_I$) versus sample or tail number; and differences between the difference between the initial and after density and a density of a reference base substance ($\Delta = [(\rho_A - \rho_I) - \rho_R]$) versus sample or tail number.

10. The method according to claim 1, wherein step (f) is automated.

11. The method according to claim 10, wherein the automation of step (f) includes a computer system with computer graphics hardware and software, which is connected to the densitometer, such that densitometer measurements of the density of the tails of rollout proofs are directly inputted to the computer and the graph of the curve is automatically plotted.

12. An apparatus for determining the drying rate of a liquid, comprising:

container means for containing a volume of the liquid;

a capillary tube, having a predetermined diameter, and first and second opposite open ends, such that a first end of the capillary tube is capable of being immersed in the volume of said liquid;

an inert gas source for supplying a flow of an inert gas that is not chemically reactive with said liquid, said inert gas source being connected to said second open end of said capillary tube; and

pressure-sensing means for measuring a pressure of said flow of said inert gas, and clock means for measuring a length of time, that is required to force an amount of said liquid, that has been drawn from said volume of said liquid in said container into said capillary tube through said first open end of said capillary tube by capillary action, after said first open end of said capillary tube has been immersed into said volume of said liquid, from said capillary tube and for a bubble of said inert gas to form in said container means containing said volume of said liquid whose drying rate is being measured.

13. An apparatus of claim 12 wherein a second capillary tube is included.

14. A method for determining the drying rate of a liquid film, comprising:

providing a container holding a volume of the liquid;

providing a capillary tube, having a predetermined diameter, and first and second opposite open ends, such that said first end of said capillary tube is capable of being inserted into said container;

providing a source for supplying an inert gas that is not reactive with said liquid whose drying rate is being determined, connected to said second open end of said capillary tube;

immersing said first open end of said capillary tube into said container holding said volume of said liquid whose drying rate is being determined, so as to cause an amount of said liquid to be drawn into said first open end of said capillary tube by capillary action;

causing an amount of said inert gas, of measured pressure, to flow into said second open end of said capillary tube, simultaneously with (d), and measuring a length of time until said amount of liquid in said capillary tube has been forced out therefrom and a bubble of said inert gas is detected in said container holding said volume of said liquid;

repeating steps (d) and (e); and

determining the drying rate of said liquid from measurements of the lengths of time and increases in pressure required, from one measurement to a subsequent measurement, of said inert gas that is required to force said liquid out from said first open end of said capillary tube and for said bubble of said inert gas to form in said container of said liquid.

15. The method of claim 14 wherein a second capillary tube is included.

16. An apparatus for determining the drying rate of a liquid film, comprising at least one pair of electrodes in contact with the liquid film; said electrodes connected to a device capable of measuring electrical conductance or resistance of the liquid film.

17. The apparatus according to claim 16 wherein the liquid is selected from the group consisting of coatings, inks, paints, lacquers or adhesives.

18. The apparatus according to claim 17, wherein the liquid is an ink.

19. The apparatus according to claim 16, wherein when the liquid film thickness ranges from 0.001mm to 5.0 mm.

20. The apparatus according to claim 16, wherein the pair of electrodes is selected from the group consisting of conductive metal, conductive soft rubber, elastomer, adhesive or high viscosity liquid.

21. The apparatus according to claim 20, wherein the conductive metal is aluminum foil.

22. The apparatus according to claim 16, further comprising a non-conductive material on which is disposed the electrodes.

23. The apparatus according to claim 22, wherein the non-conductive material is glass.

24. The apparatus of claim 22 wherein the non-conductive material serves as a substrate for the liquid film and has electrodes embedded therein.

25. The apparatus according to claim 24, wherein the electrodes individually are about 1 cm to about 30 cm in length.

26. The apparatus according to claim 24, wherein the electrodes are spaced between 0.1 mm to 200 mm from each other.

27. A method for determining the drying rate of a liquid film, comprising:

applying the liquid film onto a substrate;

bringing said liquid film into contact with at least one pair of electrodes connected to a device capable of measuring the electrical conductance or resistance of the liquid film; and

determining the drying rate of the liquid film by graphical correlation of the electrical conductance or resistance measurements of the liquid film.

28. The method according to claim 27, further comprising the step of curing the liquid with an actinic radiation source prior to step (c).

29. The method according to claim 28, wherein the actinic radiation source is ultraviolet light.

30. The method according to claim 27, wherein the liquid film is selected from the group consisting of coatings, inks, paints, lacquers or adhesives.

31. The method according to claim 27, wherein the liquid film is an ink.

32. The method according to claim 27, wherein when the liquid film thickness ranges from 0.001 mm to 5.0 mm.

33. The method according to claim 27, wherein the pair of electrodes is selected from the group consisting of conductive metal, conductive soft rubber, elastomer, adhesive or high viscosity liquid.

34. The method according to claim 31, wherein the conductive metal is aluminum foil.

35. The method according to claim 27, wherein the electrodes are disposed on a non-conductive material.

36. The method according claim 33, wherein the non-conductive material is glass.

37. The method of claim 33, wherein the non-conductive material serves as a substrate for the liquid film and has electrodes embedded therein.

38. The method according to claim 35, wherein the electrodes individually are about 1 cm to about 30 cm in length.

40. The method according to claim 35, wherein the electrodes are spaced between 0.1 mm to 200 mm from each other.